National Institute of Environmental Health Sciences

Climate change and health with an emphasis on interactions with ultraviolet radiation: A review

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Abstract:

Climate change is increasingly recognized as a major risk to human health, and health concerns are assuming more importance in international debates on mitigation and adaptation strategies. Health consequences of climate change will occur through direct and indirect routes, and as a result of interactions with other environmental exposures. Heatwaves will become more common and are associated with higher mortality particularly in the elderly and those with pre-existing cardiovascular and respiratory illnesses. Warmer ambient temperatures will result in more dehydration episodes and increased risks of renal disease and, through effects on pollen seasons, there may be an increase in allergic disease such as asthma and hayfever. Other adverse effects including on air quality, food safety and security and an expanding distribution of some infectious diseases, including vector-borne diseases, are postulated. A related but separate environmental exposure is that of ultraviolet radiation (UVR). Interactions between climate change and stratospheric ozone (and the causes of ozone depletion) will cause changes to levels of ambient UVR in the future and warmer temperatures are likely to change sun exposure behaviour. Co-occurring effects on aquatic and terrestrial ecosystems have potential consequences for food safety, quality and supply. Climate change-related exposures are likely to affect the incidence and distribution of diseases usually considered as caused by UVR exposure; and changes in UVR exposure will modulate the climate change effects on human health. For example, in some regions warmer temperatures due to climate change will encourage more outdoor behaviour, with likely consequences for increasing skin cancer incidence. Although many of the health outcomes of both climate change and the interaction of climate change and UVR exposure are somewhat speculative, there are risks to over- or under-estimations of health risks if synergistic and antagonistic effects of co-occurring environmental changes are not considered.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event, Food/Water Quality, Food/Water Security, Solar Radiation, Temperature

Air Pollution: Allergens, Ozone

Extreme Weather Event: Flooding

Food/Water Security: Agricultural Productivity

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co–Harm (Adaption/Mitigation):

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact:

specification of health effect or disease related to climate change exposure

Cancer, Cardiovascular Effect, General Health Impact, Infectious Disease, Mental Health/Stress, Respiratory Effect

Infectious Disease: Foodborne/Waterborne Disease, Vectorborne Disease, Zoonotic Disease

Foodborne/Waterborne Disease: Cholera, Schistosomiasis

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue, Malaria

Zoonotic Disease: Hantavirus Pulmonary Syndrome

Mental Health Effect/Stress: Mood Disorder, Stress Disorder

Respiratory Effect: Upper Respiratory Allergy

Intervention:

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly, Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified